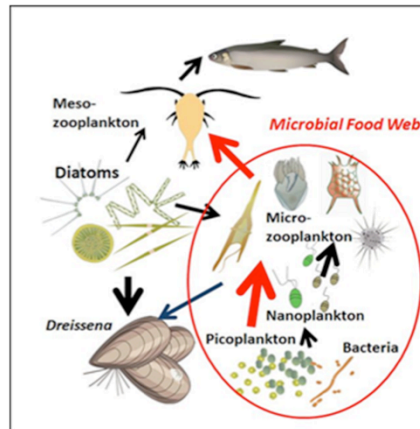


## Ecosystem Dynamics Overview

Hank Vanderploeg  
Ecosystem Dynamics



Observations → Experiments → Concepts → Models/Applications

## EcoDyn Essence & Guiding Principles

***EcoDyn research strives to develop understanding and tools to improve capacity for managing water quality, fisheries, and ecosystem and human health.***

### Guiding Principles:

- Collaborative effort with focus on priority ecological problems in the Great Lakes.
- Quantitative measurements of important ecosystem variables at appropriate time and space scales
- Complement observations with experiments and models for understanding
- Develop forecasts and applications that are built on a solid foundation of empirical observations and understanding

*In following these principles, EcoDyn completes all elements of the R&D production chain shown below*

Observations → Experiments → Concepts → Models/Applications

2/5

Paraphrased from the GLERL Strategic Plan 2016-2020 found at: [http://www.glerl.noaa.gov/review2016/reviewer\\_docs/GLERLStrategicPlan2016.pdf](http://www.glerl.noaa.gov/review2016/reviewer_docs/GLERLStrategicPlan2016.pdf)

## Some Great Lakes Management Issues

Harmful and nuisance  
algal blooms nearshore



Sufficient carrying capacity for  
desirable fish production



Salmon vs. Asian Carp

+ How will climate change affect this?

## EcoDyn research goals address Great Lakes management needs and align with NOAA Goals

### EcoDyn Broad Research Goals ↔ NOAA Goals:

- |  |  |
|--|--|
| <b>Goal 1:</b> A holistic understanding of the role of established and potential future invasive species on Great Lakes ecosystems | ↔ <b>Healthy Oceans</b>                              |
| <b>Goal 2:</b> An integrated understanding of the spatial organization of nutrient loads and food webs                             | ↔ <b>Healthy Oceans</b>                              |
| <b>Goal 3:</b> The capacity to forecast effects of climate change on Great Lakes food webs   | ↔ <b>Climate Adaptation</b>                          |
| <b>Goal 4:</b> A quantitative understanding of the drivers of HABs to predict their concentration, extent, movement, and toxicity  | ↔ <b>Resilient Coastal Communities and Economies</b> |

Observations → Experiments → Concepts → Models/Applications

4/5

From the GLERL Strategic Plan 2016-2020 found at: [http://www.glerl.noaa.gov/review2016/reviewer\\_docs/GLERLStrategicPlan2016.pdf](http://www.glerl.noaa.gov/review2016/reviewer_docs/GLERLStrategicPlan2016.pdf)

#### Goals 1 & 2 Healthy Oceans

- Improved understanding of ecosystems to inform resource management decisions
- Sustainable fisheries and safe seafood for healthy populations and vibrant communities

#### Goal 3 Climate Adaptation and Mitigation

Improved scientific understanding of the changing climate system and its impacts

#### Goal 4 Resilient Coastal Communities and Economies

Improved coastal water quality supporting human health and coastal ecosystem services

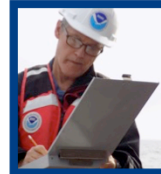
## The EcoDyn Team Presenters



**Hank Vanderploeg**  
(Theme Lead)  
Overview  
Experiments & Concepts



**Tim Davis**  
Harmful Algal  
Blooms from  
Satellites to  
Genomes




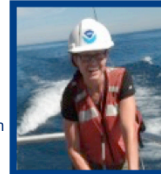
**Ed Rutherford**  
Forecasting Invasive  
Species Impacts and  
Distributions in the  
Great Lakes



**Hongyan Zhang**  
What if Asian  
Carp Establish  
in the Great  
Lakes?  




**Rochelle Sturtevant**  
Great Lakes  
Nonindigenous  
Species  
Information System  




**Ashley Baldrige**  
Dreissenid Mussel  
Population  
Dynamics and  
Processes




**Steve Pothoven**  
Core LTR Seasonal  
Nutrient, Plankton,  
and Fisheries  
Research Monitoring



**Doran Mason**  
Fine-scale Spatial  
and Temporal  
Dynamics of the  
Food Web



**Mark Rowe**  
Biophysical  
Modeling  


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The presenters are a mix of GLERL, CILER, and Sea Grant folks who are reporting out on significant ongoing research of interest. Much EcoDyn's base-funded research is focused on subprojects associated with observations, experiments, and modeling associated with the LTR program. Expansion of the LTR program in some years has been supported by the Coordinated Science and Monitoring Initiative (CSMI). The program on HABs, the other major focus of the group, is heavily supported by GLRI. GLANSIS and work on Asian carps have also been subsidized by external funds.

**The EcoDyn group federal PI staff includes:** Hank Vanderploeg, Ashley Baldrige, Tim Davis, Doran Mason, Steve Pothoven, and Ed Rutherford

**The federal support staff includes:** Joann Cavaletto, Dave Fanslow, Duane Gossiaux, Nancy Morehead  
We are also heavily dependent on CILER and contract support staff.

You will get a chance to meet the support staff during the lab tour and one-on-one session with support folks.